

Test for **Molecular Crystals** Activity

Name _____ Date _____
 Teacher _____ Class _____

Check one:

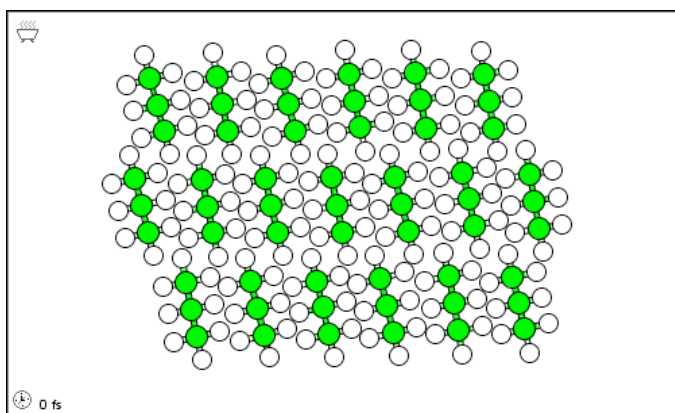
Pretest

Posttest

1. Which of the following molecules shows a molecular crystalline solid?

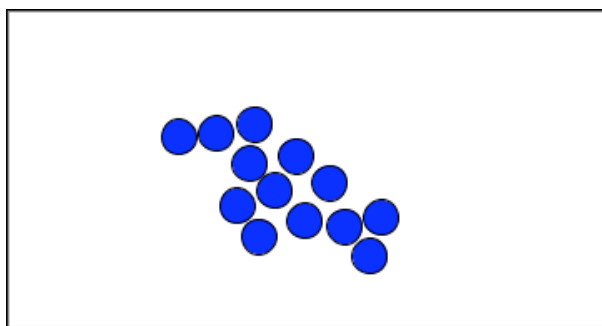
Note: each ball in these models represents a single atom.

a) Is this image a molecular crystal? (Yes, No)



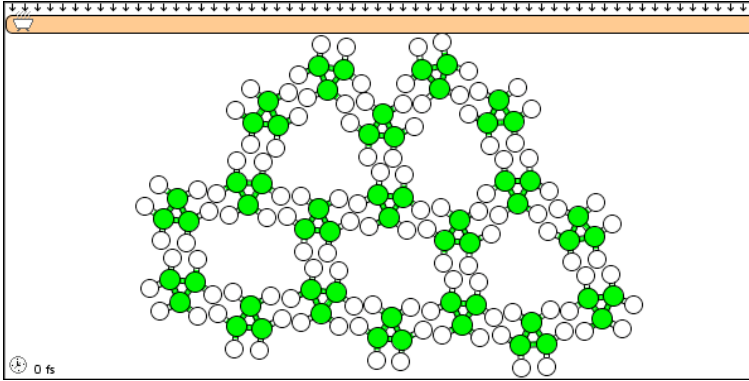
| | |
|-------------|---|
| Selects Yes | 1 |
| Selects No | 0 |

b) Is this image a molecular crystal? (Yes, No)



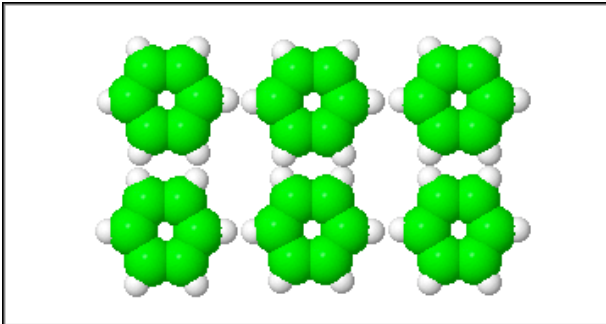
| | |
|-------------|---|
| Selects No | 1 |
| Selects Yes | 0 |

c) Is this image a molecular crystal? (Yes, No)



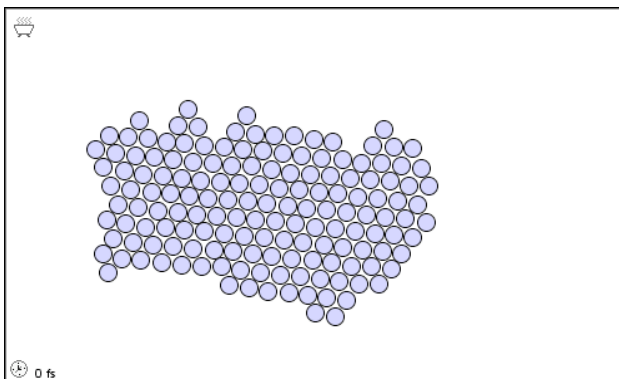
| | |
|-------------|---|
| Selects Yes | 1 |
| Selects No | 0 |

d) Is this image a molecular crystal? (Yes, No)



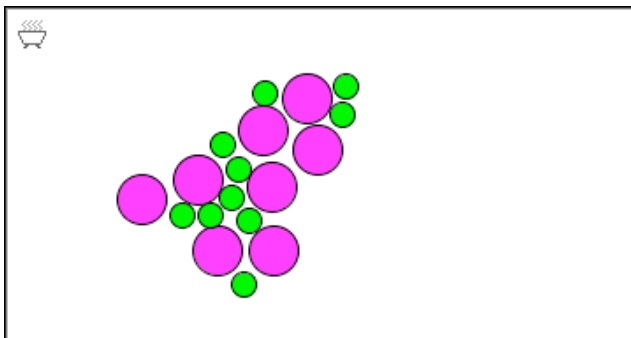
| | |
|-------------|---|
| Selects Yes | 1 |
| Selects No | 0 |

e) Is this image a molecular crystal? (Yes, No)



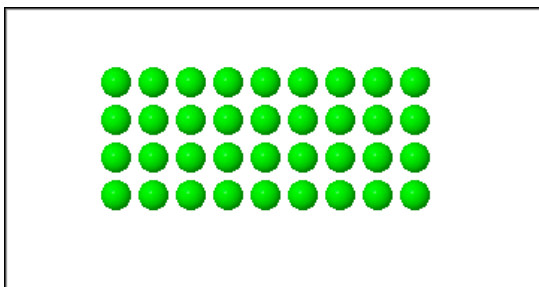
| | |
|-------------|---|
| Selects Yes | 1 |
| Selects No | 0 |

f) Is this image a molecular crystal? (Yes, No)



| | |
|-------------|---|
| Selects No | 1 |
| Selects Yes | 0 |

g) Is this image a molecular crystal? (Yes, No)



| | |
|-------------|---|
| Selects Yes | 1 |
| Selects No | 0 |

2. Pick two molecular crystals from the images above. Record the letters and answer the following questions:

Which of the crystals would compress more easily? Explain your reason.

| | |
|---|---|
| Response includes... | |
| Selects two molecular crystals and indicates the crystal that would be more likely to compress has large inter-molecular spaces that enable the molecule to compress. | 2 |
| Picks two molecular crystals and chooses the correct one but does not give an explanation. | 1 |
| Other | 0 |

3. Polymorphism is an important development in pharmaceuticals. Many drugs are receiving approval for only a single crystal form or polymorph. Imagine that in a patent case a company was claiming it used a polymorph II type of ingredient instead of a polymorph I. Describe how a tool could work that would help the judge resolve this case.

| Response includes... | |
|---|---|
| X-ray diffraction can be used to determine the structure of individual molecules in a crystal. By creating an X-Ray diffraction image of both polymorphs, one could compare that to the one used in the drugs and identify the polymorph (much like a fingerprint). | 2 |
| Reports that x-ray diffraction is a tool that could work but doesn't describe how it could work. | 1 |
| Other | 0 |